Horizontal and Vertical Asymptotes

$$f(x) = \frac{(2x+8)(x-2)}{(x-4)(x-3)}$$

$$(x-4)(x-3) \neq 0$$

$$(x-4) \neq 0 \qquad (x-3) \neq 0$$

$$x \neq 4 \qquad x \neq 3$$

$$f(x) = \frac{\sqrt{x+4}}{(x+4)(x-5)}$$

$$(x+4)(x-5) \neq 0$$

$$(x-5) \neq 0$$

Horizontal and Vertical Asymptotes

$2(x^2 - 7x + 12) = 2x^2 + 4x - 16$

$2x^2 - 14x + 24 = 2x^2 + 4x - 16$

$-14x + 24 = 4x - 16$

$40 = 18x$

$0 = \sqrt{x+4}$

$0^2 = (\sqrt{x+4})^2$

$0 = x + 4$

$x = -4$ $\quad x \neq -4$

Horizontal and Vertical Asymptotes

$$= \frac{(2(2.9)+8)((2.9)-2)}{[redacted]}$$

$$\Rightarrow \lim_{x\to 3^-} f(x) = +\infty$$

x	$f(x)$

$$\lim_{x\to -4^+} \frac{\sqrt{x+4}}{(x+4)(x-5)}$$

$$= \frac{\sqrt{-4^+ + 4}}{(-4^+ + 4)(-4^+ - 5)}$$

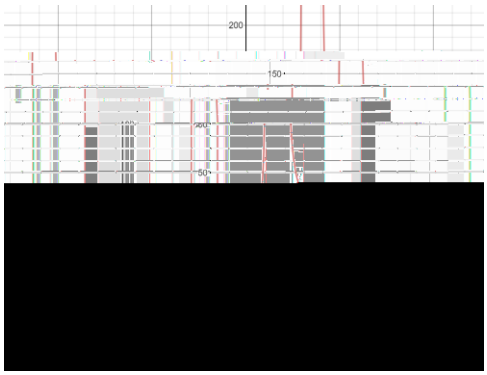
$$= \frac{\sqrt{(-3.9)+4}}{[redacted]}$$

$$= \frac{(+)}{(+)(-)} = \frac{(+)}{(-)} = (-)$$

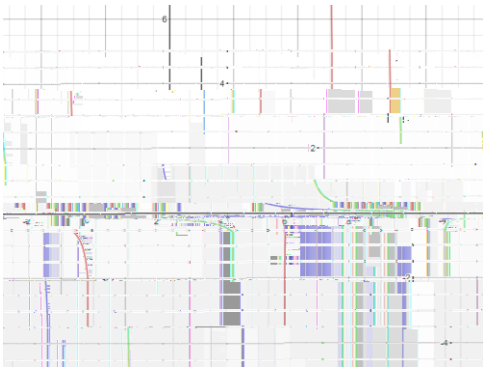
$$\Rightarrow \lim_{x\to -4^+} f(x) = -\infty$$

Graphing

Example A



Example B



Stewart James, Algebra and Trigonometry, 4th Ed.